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Science for Tomorrow's World

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THE MACMILLAN SCIENCE SERIES

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J. DARRELL BARNARD
SCIENCE EDUCATION

CELIA STENDLER
CHILD DEVELOPMENT AND ELEMENTARY EDUCATION

BENJAMIN SPOCK, M.D.
HEALTH CONSULTANT

UNDER THE EDITORSHIP OF

SIDNEY SELTZER

SCIENCE FOR TOMORROW'S WORLD: 1, 2, 3, 4, 5, 6
SCIENCE: A SEARCH FOR EVIDENCE 7
SCIENCE: A WAY TO SOLVE PROBLEMS 8
SCIENCE: A KEY TO THE FUTURE 9

Texts, Teachers' Annotated Editions, and other Complementary and Supplementary Teaching Materials

THE MACMILLAN SCIENCE SERIES

Science for Tomorrow's World 1

J. DARRELL BARNARD

CELIA STENDLER

BENJAMIN SPOCK, M.D.

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1 THE WEATHER CHANGES

Warm and Sunny

Warm and Cloudy

Cold and Sunny

Cold and Cloudy

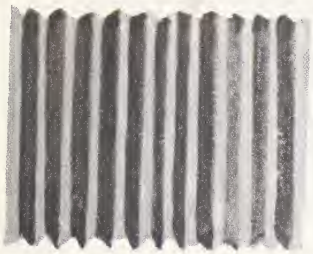
Rain

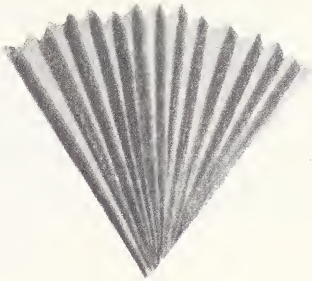
What should Bill do?

Snow

Air

Make this.



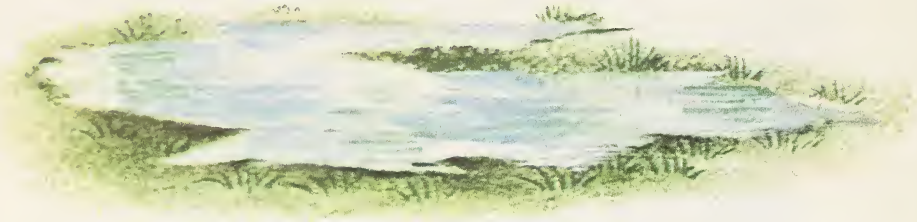


Do this.

What do you feel?

Air is all around you.

Where Does the Water Go?



The water goes into the air.

Do this.

What is different?
Where did the water go?

Which Dries Faster?

Do this.

And this.

Which Dries Faster?

Do this.

And this.

Water Comes Out of the Air

Tom is playing.
It is cold.

Tom goes in.
It is warm.

Look at Tom's glasses.
What happened?

The air is warm.
The window is cold.
What happens?

The water is cold.
The air is warm.
What happens?

Cold Air

Do this.

And this.

And this.

Where is the air colder?

Warm Air

Have your mother do this.

Do this.

And this.

What do you feel?

Clouds

Cold air pushes warm air up.
The warm air goes up high.
Then the warm air gets cold.
Little drops of water come out.
The little drops make a cloud.

Have your mother do this.

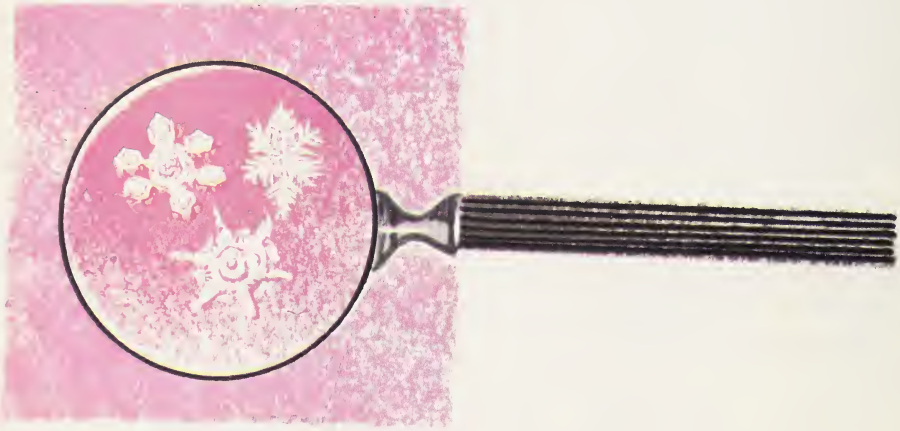
Do this.

Do you see a cloud?

The drops are like rain.
The drops get bigger and bigger.
What will happen?

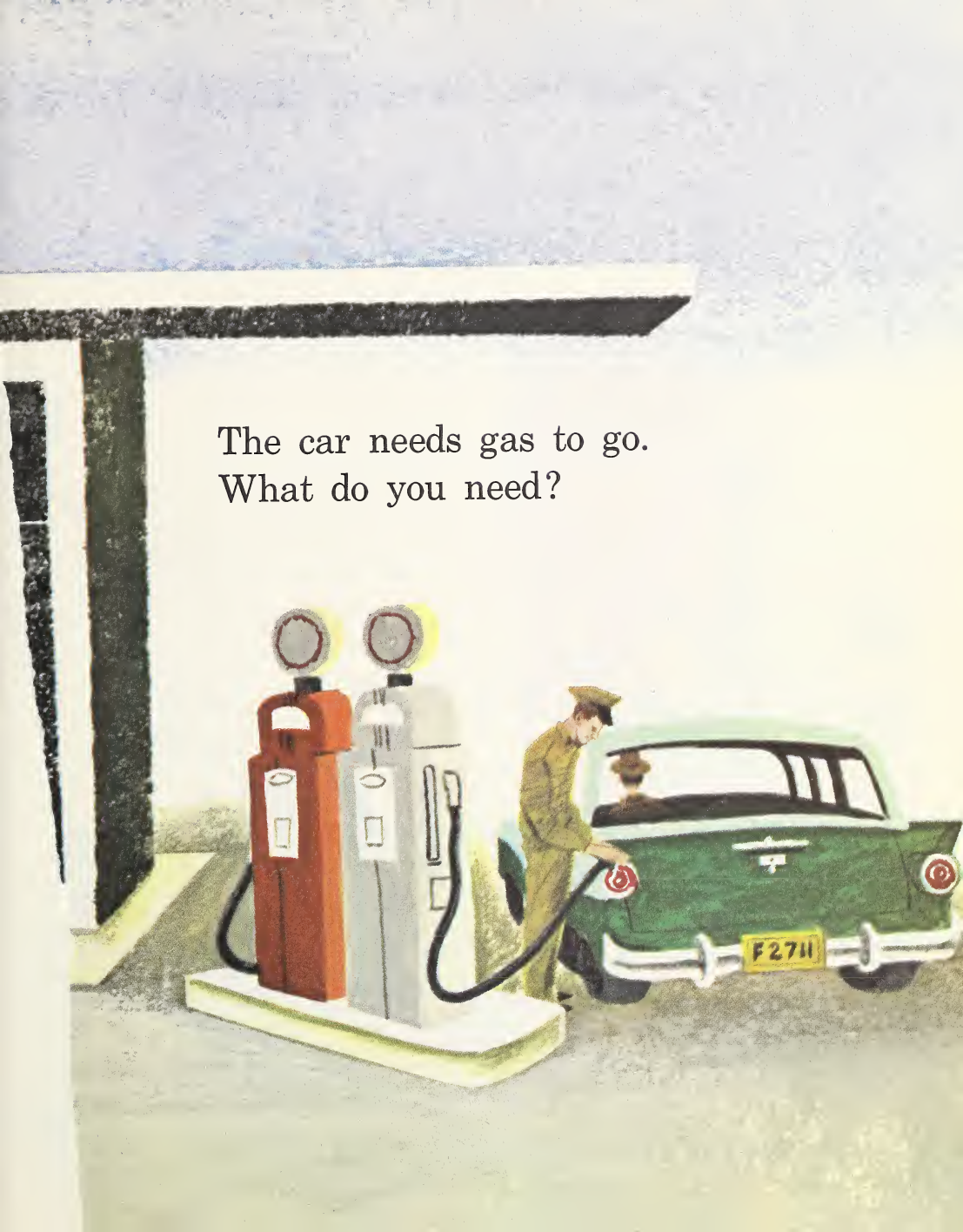
Snowflakes

The air up high is very cold.
There is water in the air.
What will happen to the water?



How are the snowflakes alike?
How are they different?

The car needs gas to go.
What do you need?



You Need a Good Breakfast

Look at Mary.
She has no time for breakfast.

What happens to Mary?
Why?

You Need a Good Lunch

Look at Jack.
He does not want to eat.

What happens to Jack?
Why?

You Need Different Foods

These foods help you grow.

These foods help you run and play.

These foods help you keep well.

Can you choose a good breakfast?
Can you choose a good lunch?

Make Something to Drink

Get these.

Do this.

Make Something to Eat

Get these.

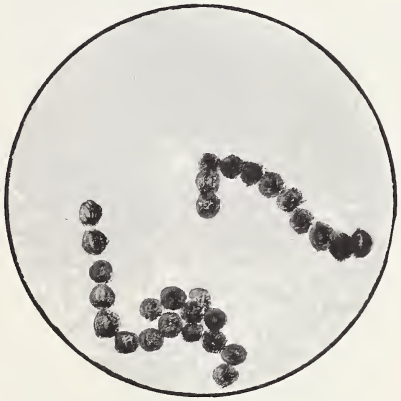
Do this.

Germs

Germs can make you sick.
Germs are very, very little.

This man can see germs.
What helps him see them?

The man sees germs that look like this.

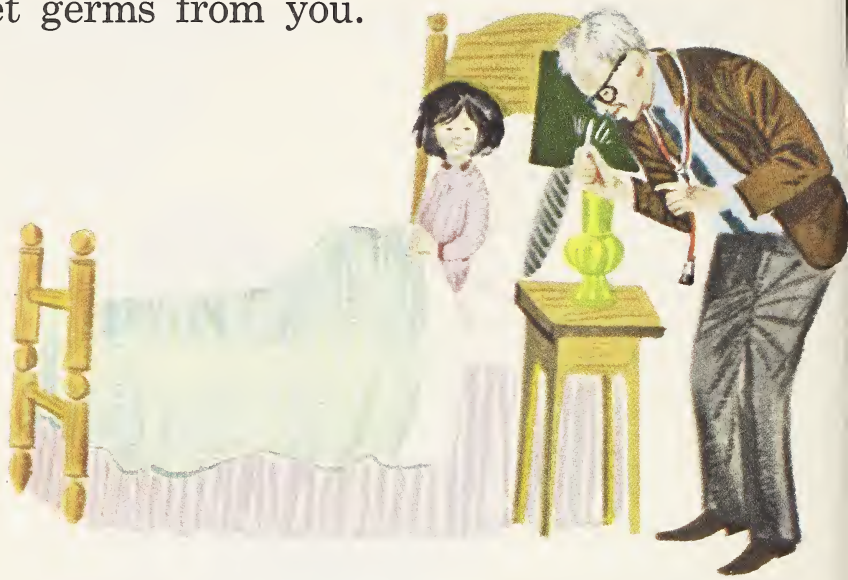


These germs are different.

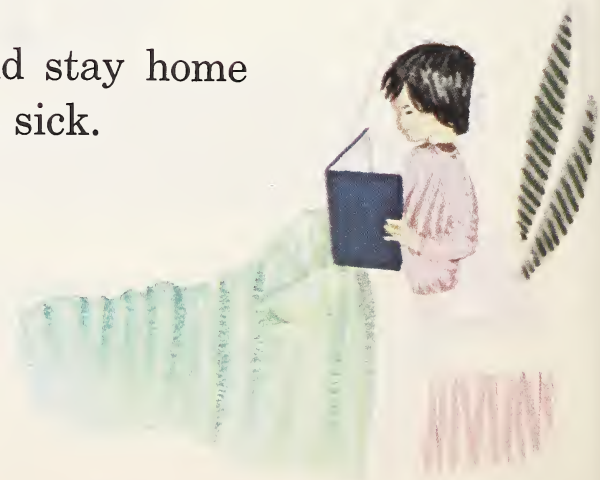
Germs can make people sick in different ways.

You can get germs from other children.

Other children can get germs from you.



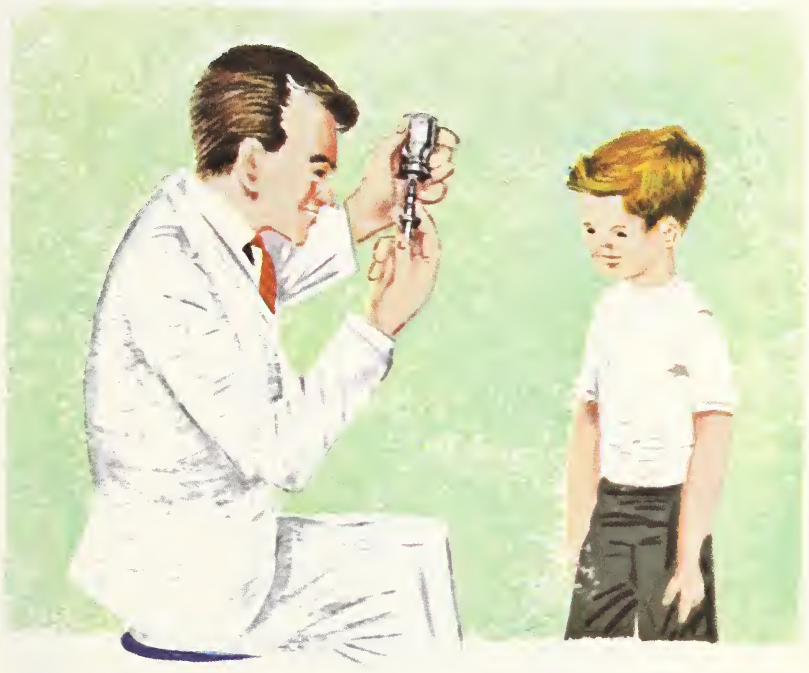
You should stay home when you are sick.



Getting Shots

Have you seen the doctor do this?

He is getting ready to give the boy a shot.



Shots help to kill germs that might make you sick.

Animals get shots too.

Shots help animals stay well.

The doctor uses a needle
to give shots.

How does a needle work?
You can find out.

Get this.

Do this.

What happens when you squeeze?
What happens when you let go?

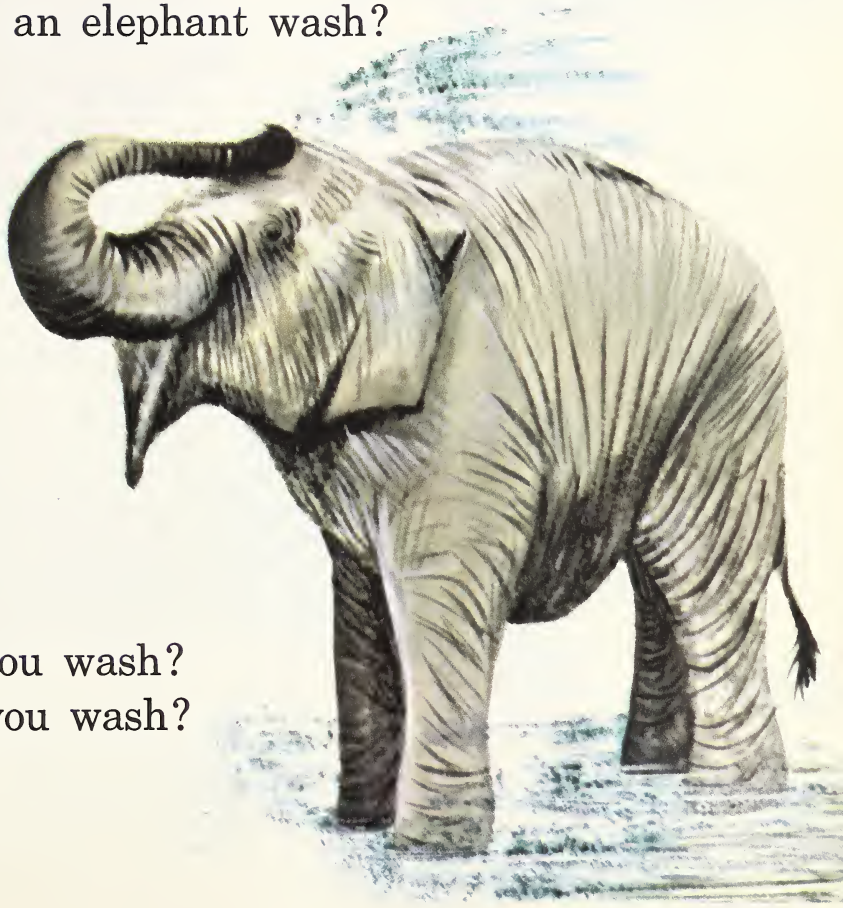
Keeping Clean

How does a cat wash?

How does a dog wash?

How does a bird wash?

How does an elephant wash?



How do you wash?
Why do you wash?

Washing Helps Us Keep Clean

What do you see?

Will these help you wash?

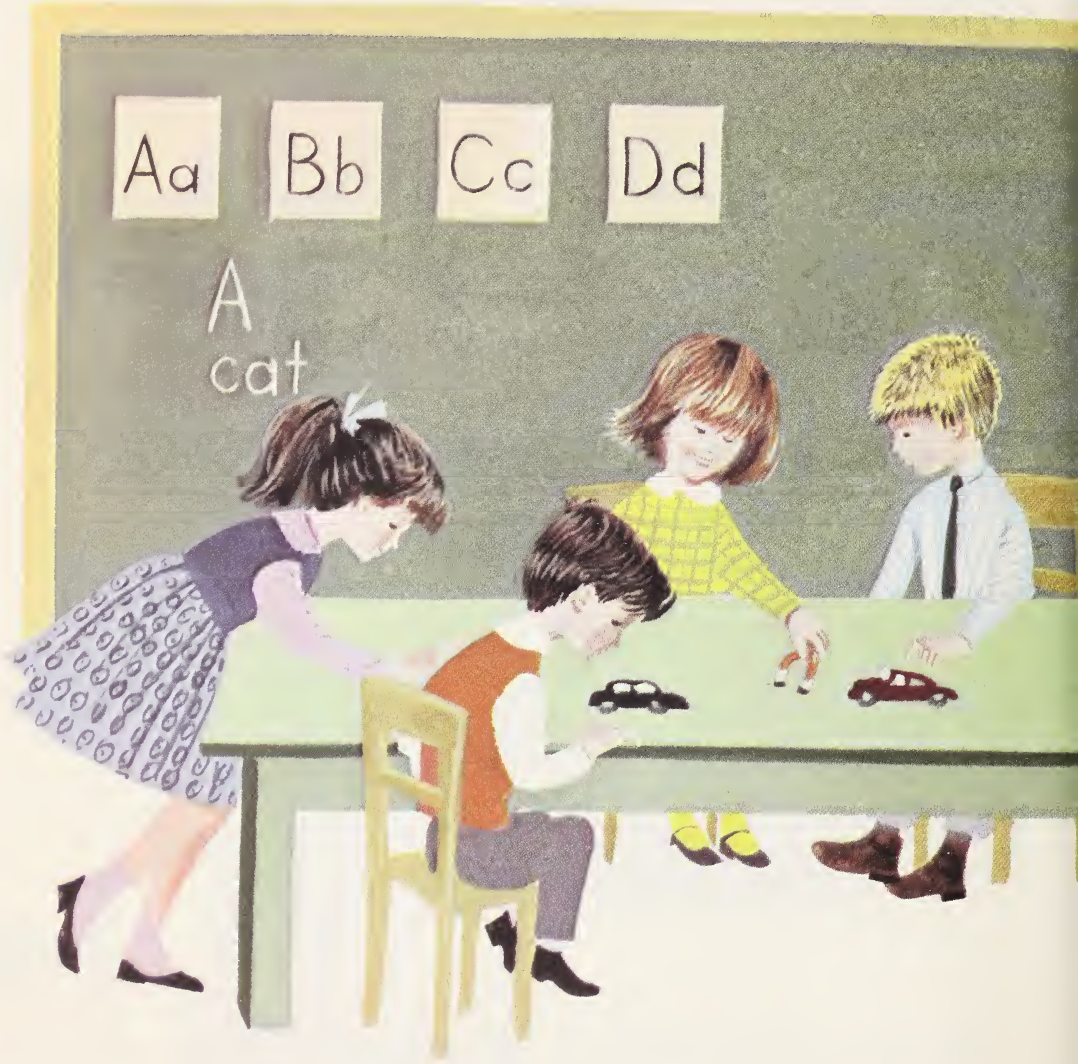
Wash with water.

What do you see?

Now wash with these.

What do you see?

3 PUSHES AND PULLS



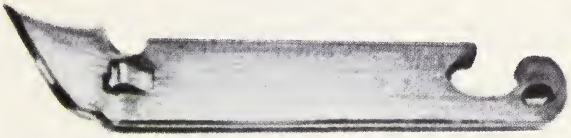
What makes things move?

Jim pulls.
What happens?

Alice pushes.
What happens?

You must push or pull
a thing to start it moving.

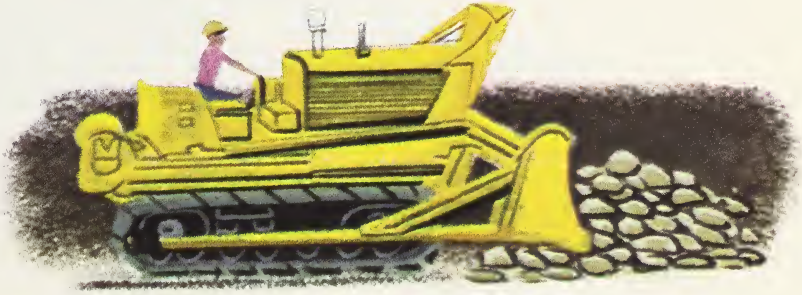
Machines Make Things Move



This is a machine.

Does it push?
Does it pull?
What does it move?

This is a big machine.

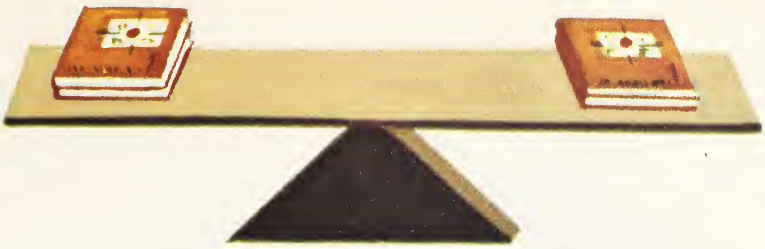


Does it push or pull?
What does it move?

The Seesaw Moves

A seesaw is a machine.
What does it move?

Anne and Peter want to seesaw.
Anne stays up in the air.
How can they make the seesaw go up and down?



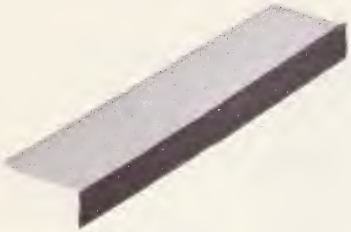
What things are the same?
What happens when they are the same?

Look at this.
What is different?
What happened?

Look at this.
What is different?
What happened?

What can you do now?
Try this.

Magnets Pull



This is a magnet.

This is a magnet.

Which things can a magnet pull?

Magnets pull through air.

Do this.

Why does the nail stay up?

Take the magnet away.
What happens?

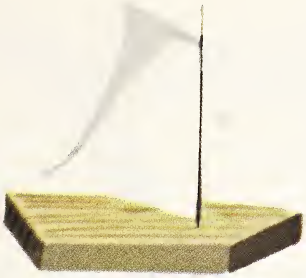
Magnets pull through glass.

Get this.

And this.

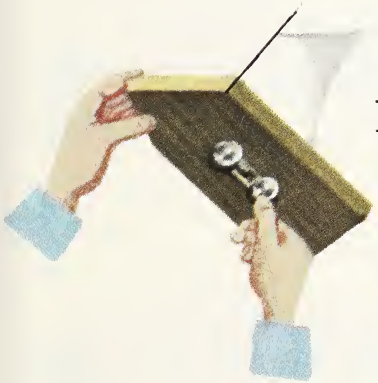
Try this.

Magnets pull through water.



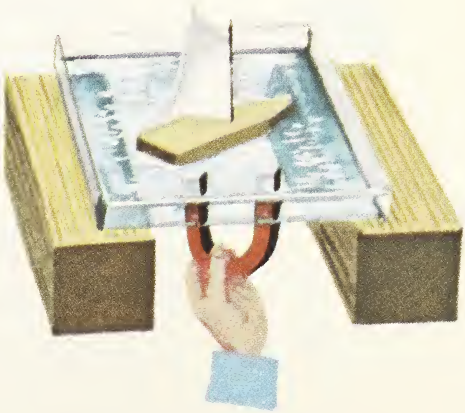
Make a boat.

Get these.



Do this.

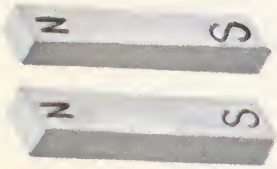
Now do this.



What happens?

The Ends of a Magnet

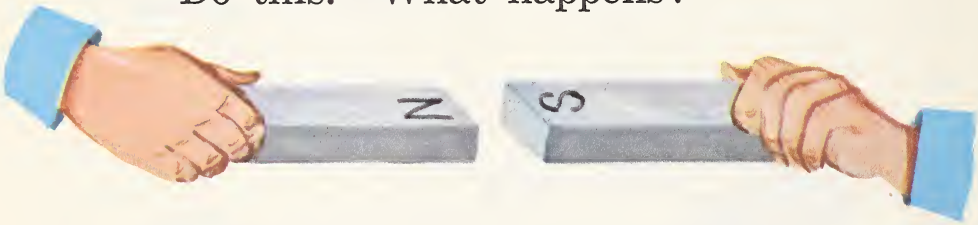
Look at the magnets.



N is for north.

S is for south.

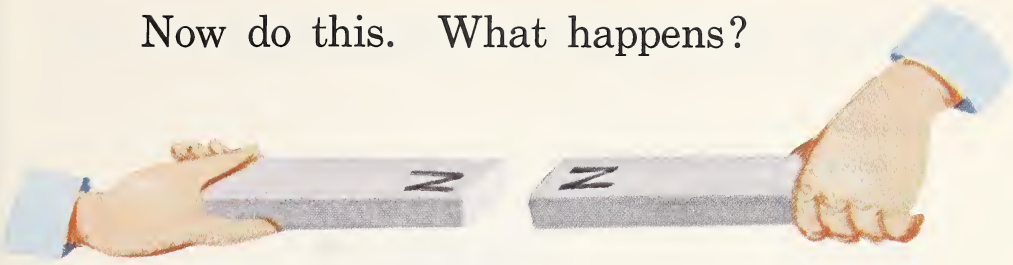
Do this. What happens?



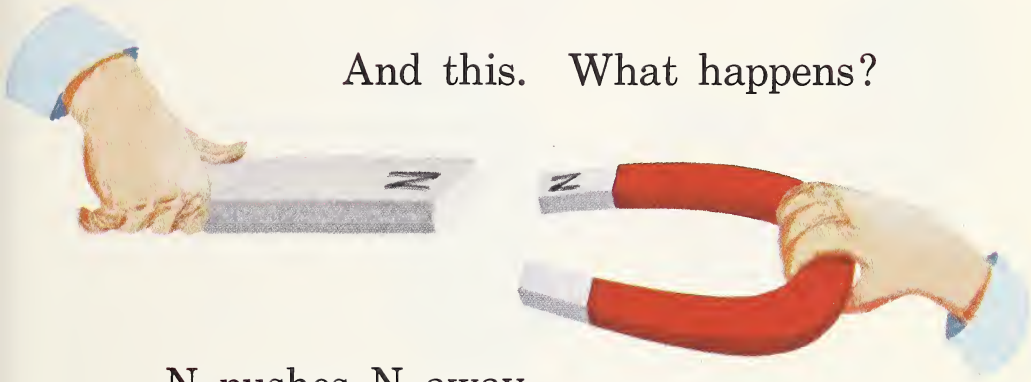
Do this. What happens?

N pulls on S. S pulls on N.
A magnet can pull on other magnets.

Now do this. What happens?



And this. What happens?



N pushes N away.

A magnet can push other magnets away.

Does S push S away?
Find out.

How Strong Are Magnets?

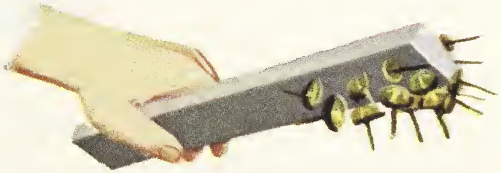
Get big magnets
and little magnets.

Are some magnets stronger
than other magnets?
How can you tell?

Where Is a Magnet Strongest?

Do this.

A magnet is strongest at the ends.



Make a Magnet

Get this.

And this.

Do this many times.

Is the needle a magnet now?
How can you find out?

Your teacher will cut the needle.

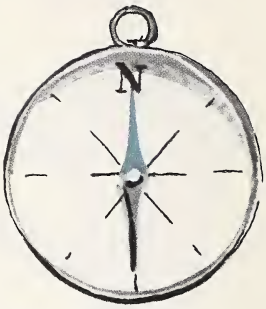
Is this a magnet?

Is this a magnet?

How can you find out?

A Compass

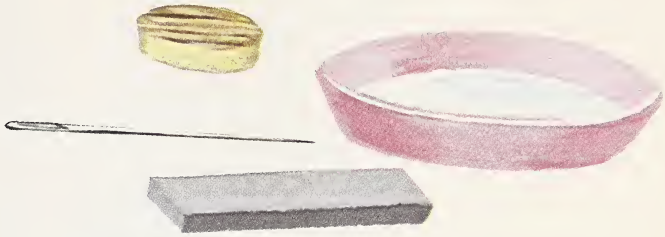
The needle in a compass is a magnet.



The needle points north.
Can you find south?

Hang up a magnet this way.
N will point north.
Push the magnet.
Let it stop.
Where does N point now?

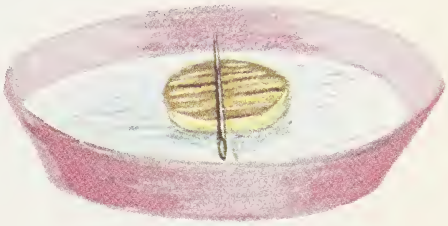
Make a Compass



Get these.

Make the needle
into a magnet.

Do this.



Does the needle point north?
Find out with your compass.

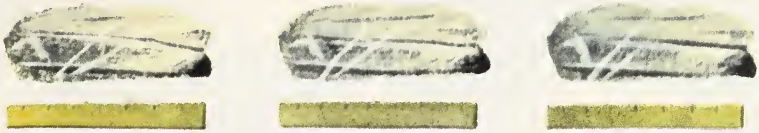
4 GROWING UP

Don and Mary grew.
Which parts grew most?

Some children grow faster than other children. These children are all six years old.

How are the children different?

What Things Grow?



Does a rock grow?

Does a plant grow?

Does a kitten grow?

Plants and animals grow.

Bones

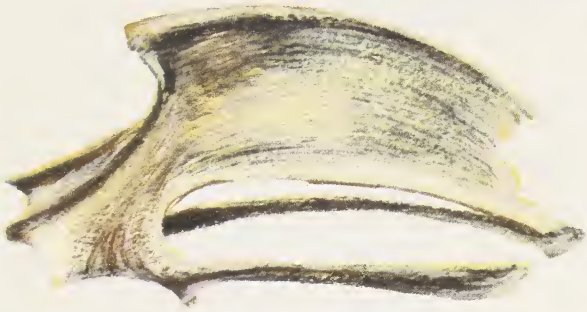
Bones grow.
Find some long bones.
Find some little bones.

Sometimes a bone breaks.
A doctor can see the bone
on an X-ray picture.

The doctor must set the bone.
The bone will grow together.

These are chicken bones.
Get some chicken bones.

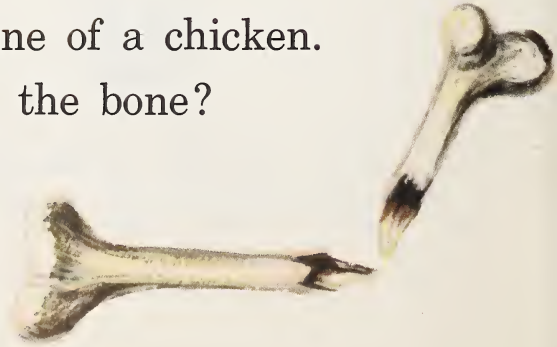
Wing bone



Breastbone

Leg bone

Break a leg bone of a chicken.
What is inside the bone?

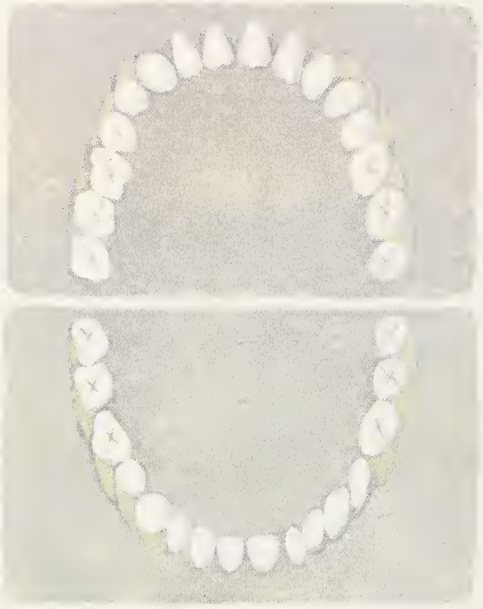


How Do Teeth Grow?

Sally's baby teeth are coming out.
New teeth are growing under them.
She cannot see them yet.
The dentist can see them
on an X-ray picture.

Sally will get new teeth in back too.
There are no baby teeth there.

Sally's new teeth will look like this.



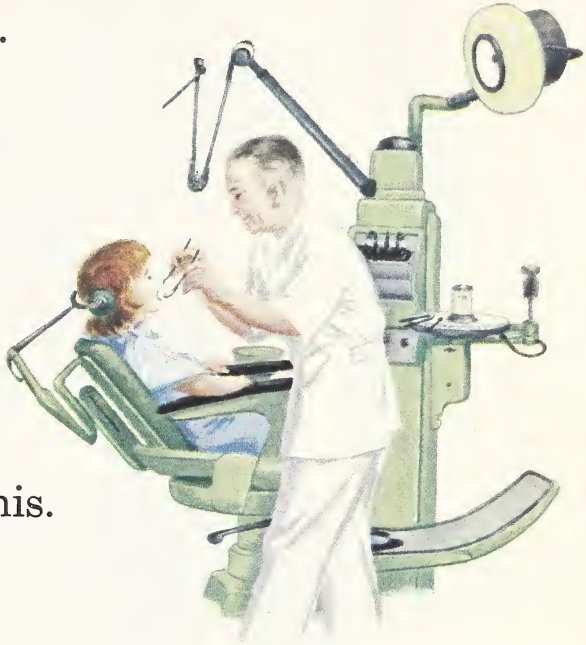
How many teeth will Sally have?

Sally must take care of her teeth.

Can you tell why?

Taking Care of Your Teeth

You can do this.



And this.

You can eat these foods.
They make teeth strong.

Playing with Others

Ted wants a turn.
What can he do?

Judy is a new girl.
She wants to play.
How can the children help Judy?

David wants to play.

Fred can say, "Go away, David. We don't want you."

Or he can say, "You can play after this time."

What should Fred say?

Bob is Larry's brother.
Father is playing with Bob.
Father is not playing with Larry.

How does Larry feel?
What can Larry do?

Mother does not have time to play with Peggy.

How does Peggy feel?
What can Peggy do?

Exercise

Your heart beats.
Your heart sends blood to every part of your body.

Jump up and down many times.

Your heart will beat faster.
It will send blood faster.

Exercise helps to keep you well.

Here are some ways to exercise.
Do you exercise every day?

Rest

Animals need rest.
Some animals rest by sleeping.
How do you rest?

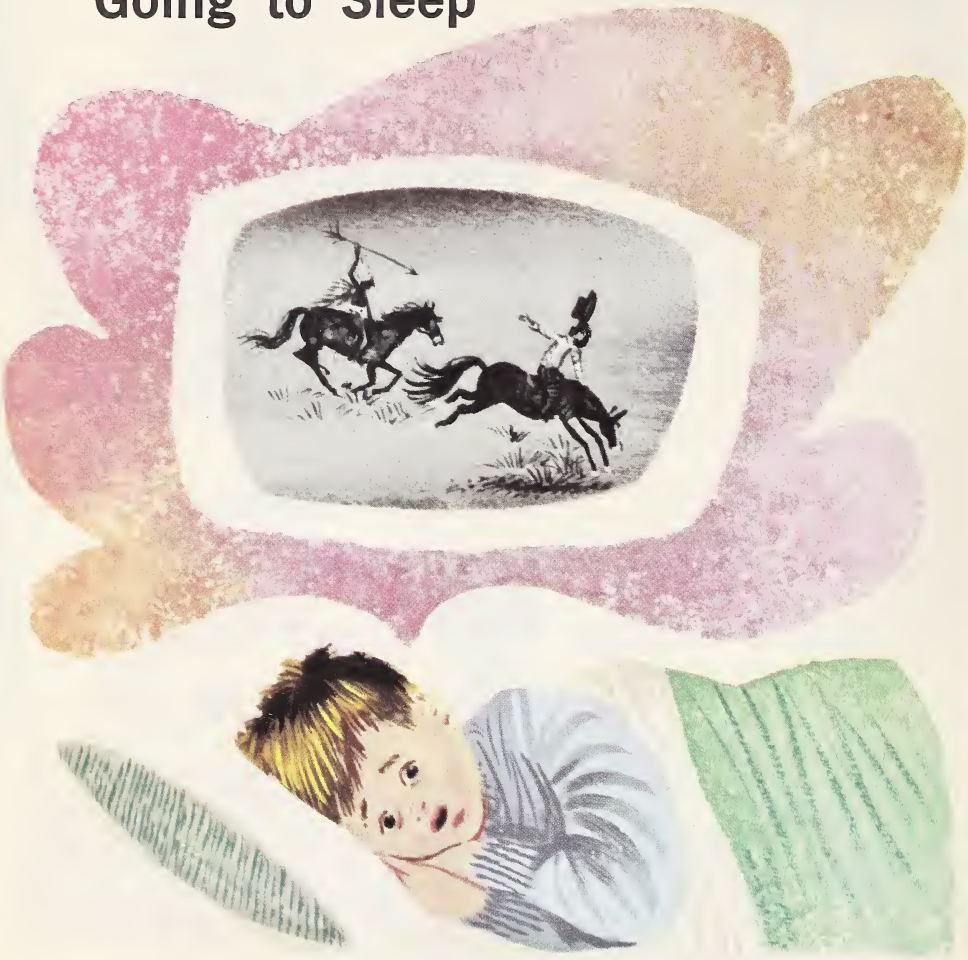
Bedtime

It is 7 o'clock.
It is bedtime.
It is winter.

It is 7 o'clock.
It is bedtime.
It is summer.

What is different?
Does this happen where you live?

Going to Sleep



Ben cannot go to sleep.

He is thinking of what he saw on television.

Ben is afraid.

He is afraid of what he thinks he hears.

He does not know what he hears.

What does Ben really hear?

Nancy is afraid.

She is afraid of what she thinks she sees.

She does not know what she sees.

What does Nancy really see?

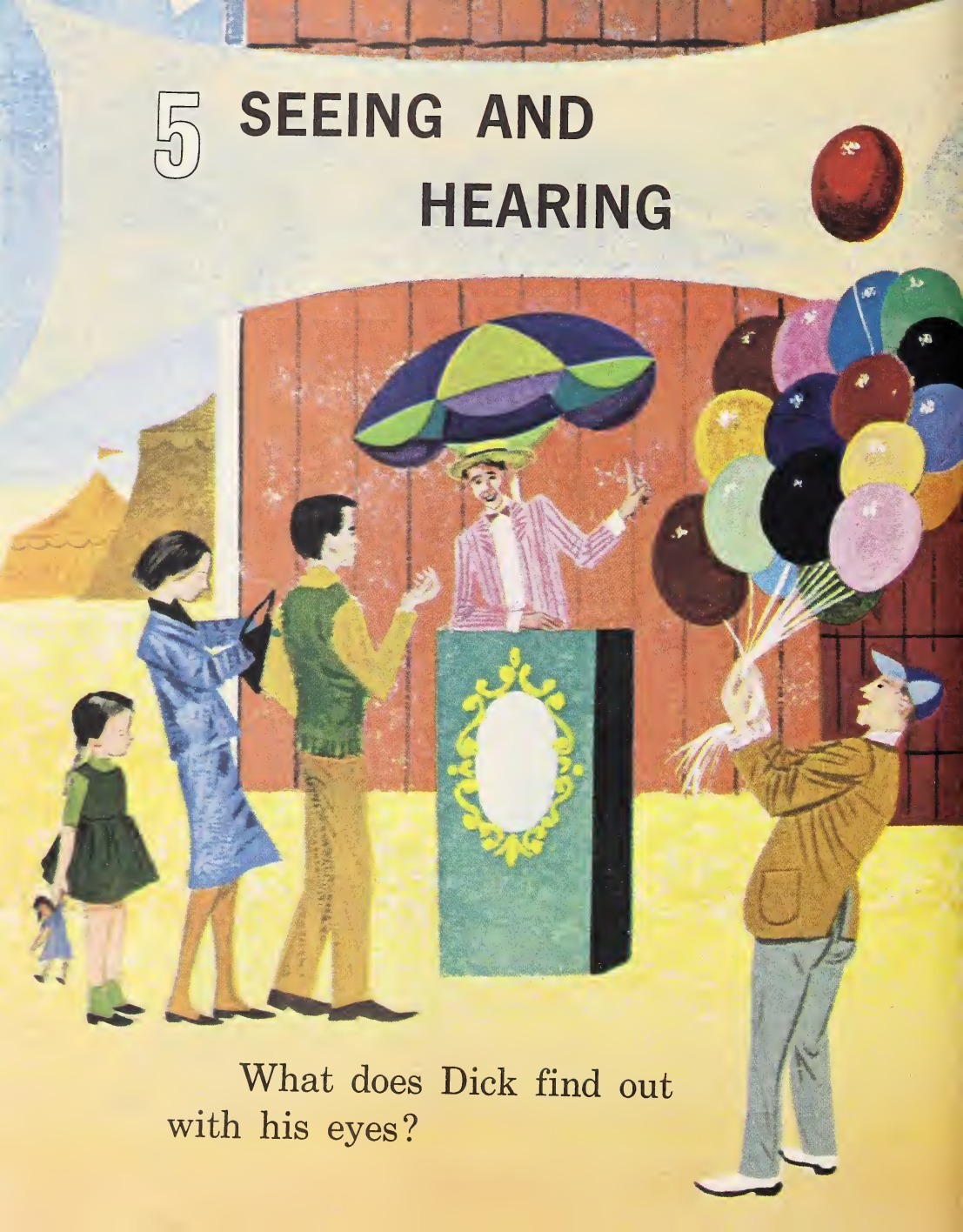
Telling Someone

It helps to tell someone when you are afraid.

Nancy is telling her mother.

Nancy feels better now.

5 SEEING AND HEARING



What does Dick find out with his eyes?

What does Dick find out with his ears?

We need light to see.
These things give light.

We can shine light on things.
Then we can see them.

Colors in White Light

The sun gives white light.
There are colors in white light.
A rainbow is made of white light.
You can see the colors in a rainbow.

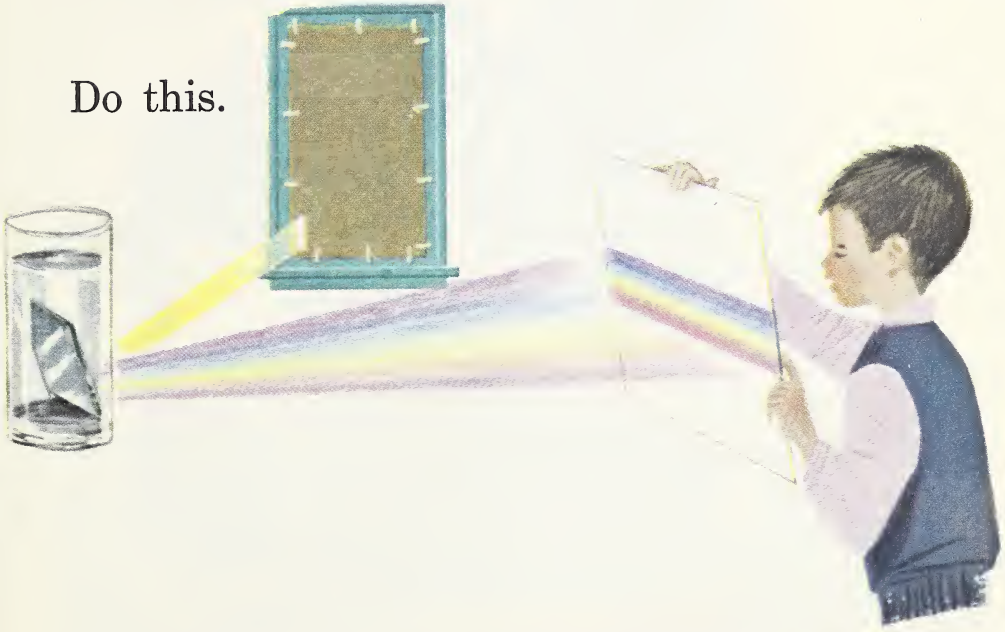
You can see the colors this way.

Get these.

Mirror

White paper

Do this.

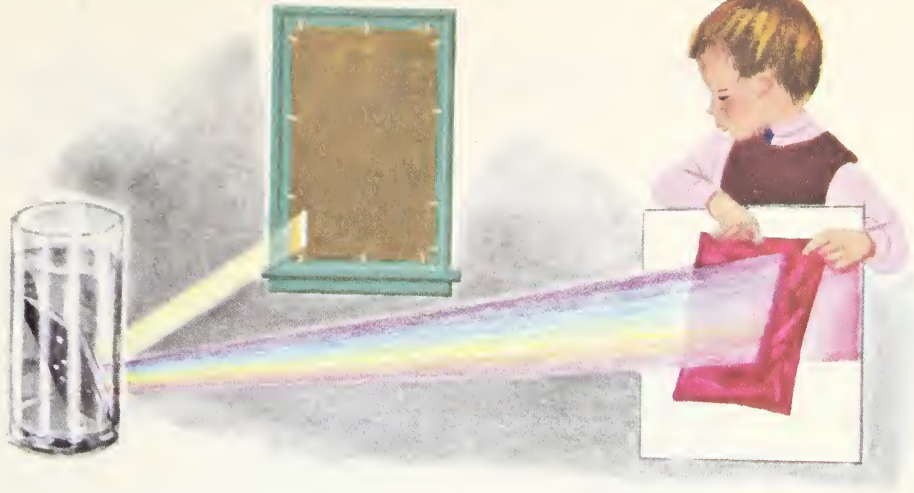


Do you see the colors on the paper?

White light has many colors.
How can you get one color?

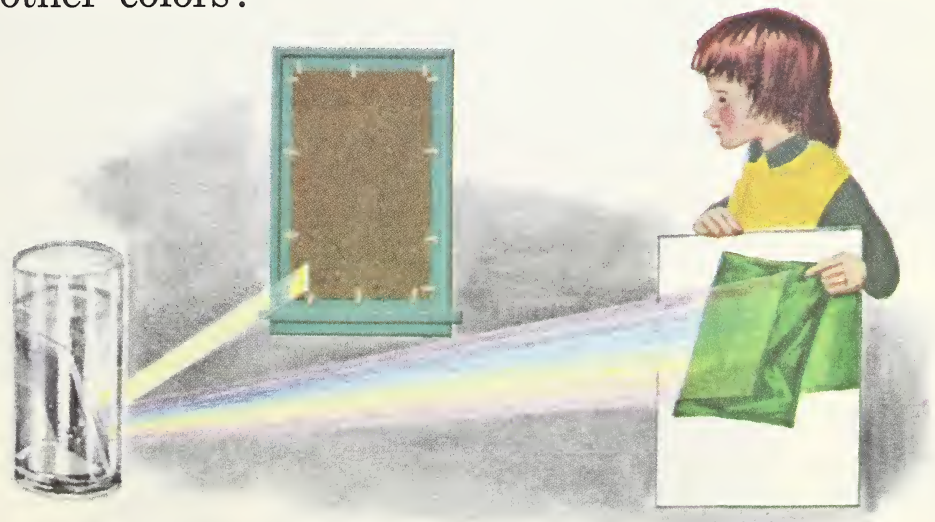
Do this.

What color do you see on the paper?
Blue takes away the other colors.



Tim wants red light.
He takes away the other colors.

Jane wants green light.
How does she take away the other colors?



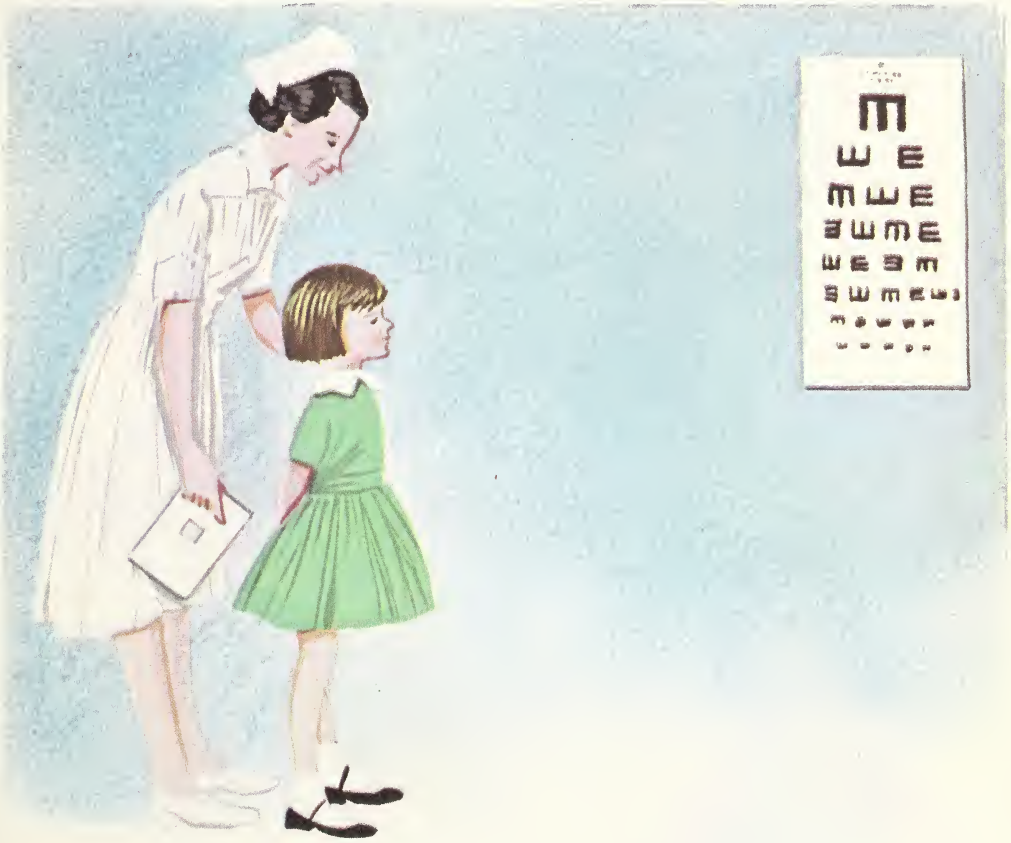
Traffic Lights

The lights tell when to go.

The lights tell when to stop.

Testing Your Eyes

What is this girl doing?



Some children do not see well.
What can help them see better?

What Makes a Sound?

Hit the stick.

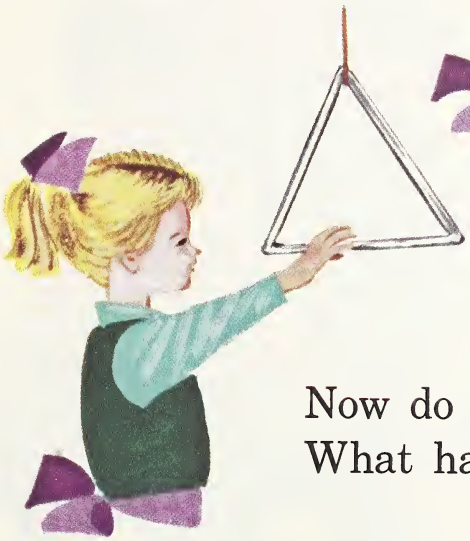
What do you see?
What do you hear?

Do this.

What do you see?
What do you hear?

You must make something move to make a sound.

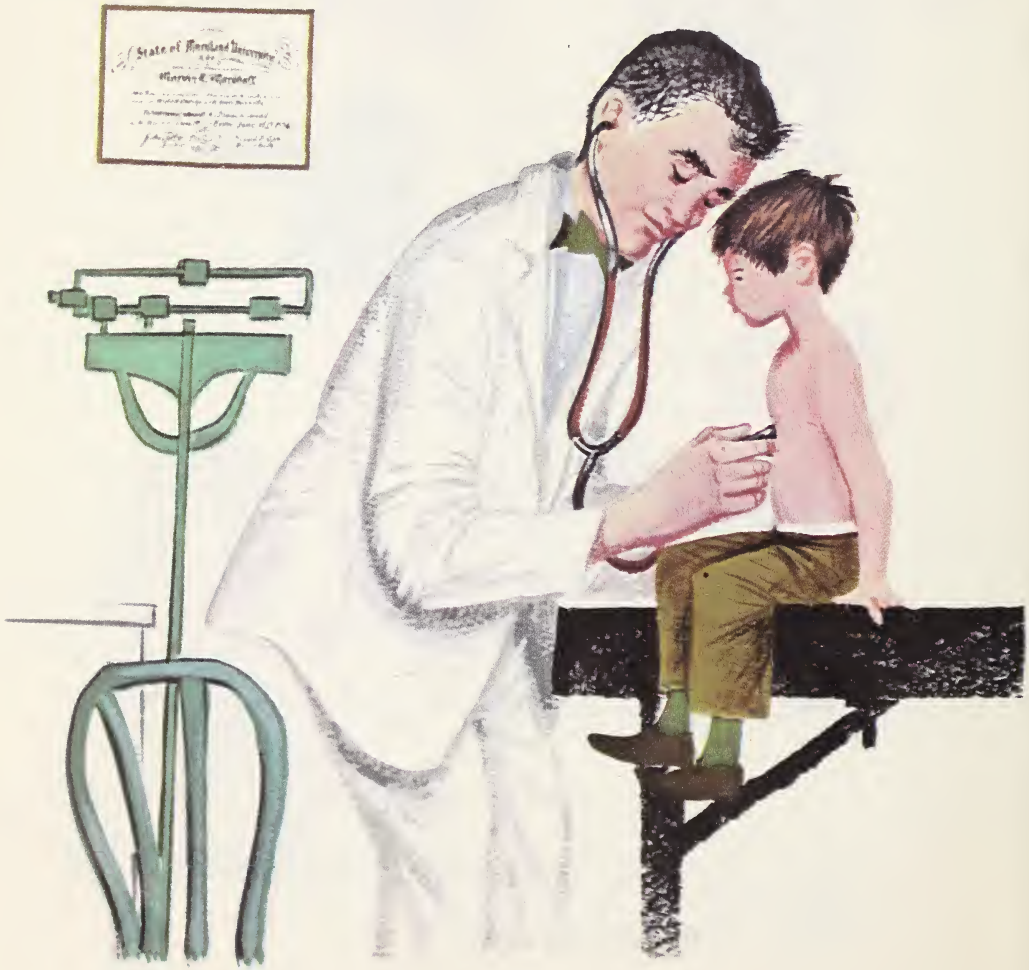
Do this.
What moves?



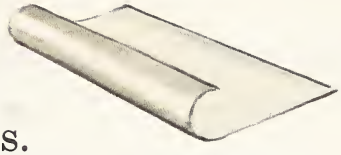
Now do this.
What happens?

You can stop something that moves.
Then the sound stops.

What does the doctor hear?
What helps the doctor hear?



Do this.



Now do this.

What do you hear?

Where Is It Louder?

Listen to a watch this way.

Now listen to a watch this way.
Do you hear it better?

Testing Your Hearing

This machine can test how well you hear.

You listen to the sound it makes.

You tell when you cannot hear the sound.

Some children do not hear well.
What can they do?

6 ANIMALS

What animals do you see?

Here are some animals.
How are they alike?
How are they different?

Insect

Crayfish

Spider

These animals are alike in some ways.
How are they alike?

Fish

Frog

Snake

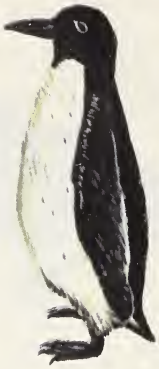
Cat

Bird

What Animals Need

These animals need food and water and air.

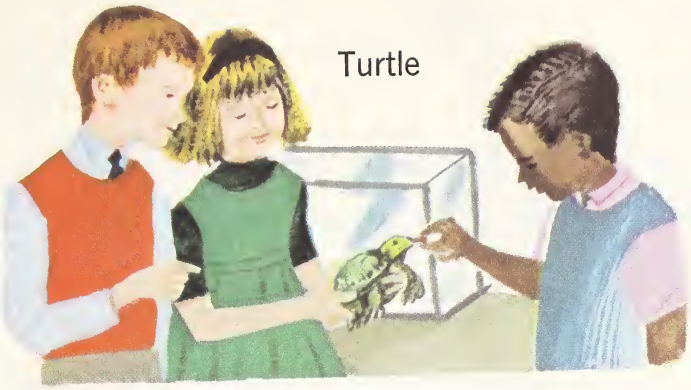
Horse



Penguin

Lion

All animals need food.
All animals need water.
All animals need air.



Turtle

You can learn about animals by taking care of them.

Maybe you can get an animal for your classroom.

First find out how to take care of it.

What will it eat?

Will the classroom be warm enough?

Guinea pig

A mother guinea pig

A father guinea pig

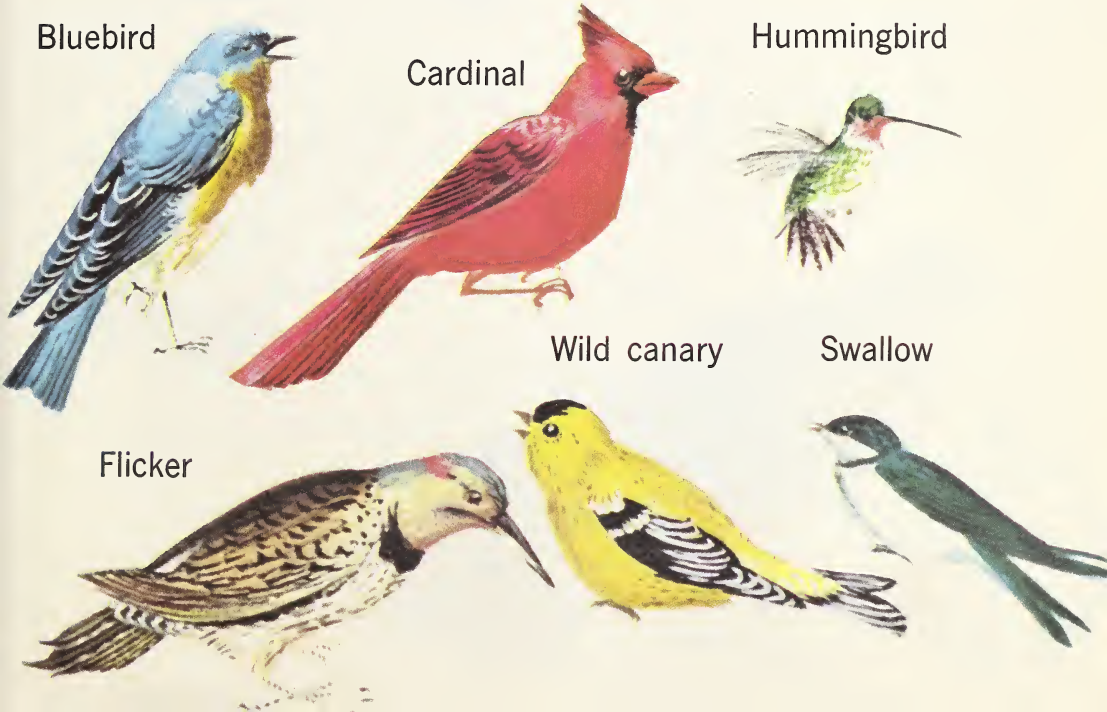
This mother has babies.
The babies will get milk from the mother.

What other animals can have babies?

Birds

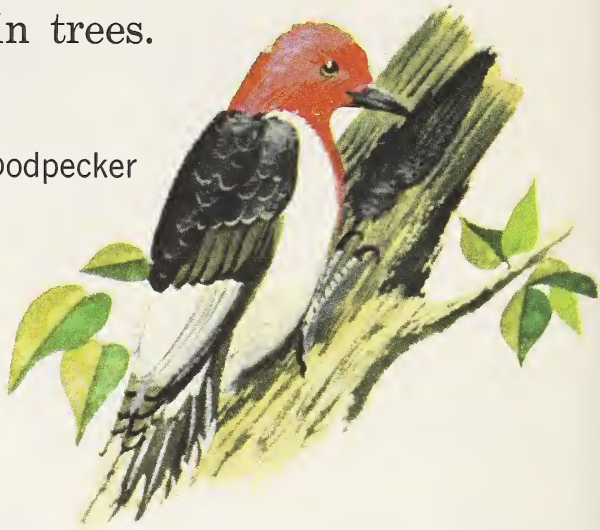
Birds are animals with feathers.
There are many different birds.

You can know birds by their color.
You can know birds by their size.
You can know birds by the way they fly.
You can also know birds by the way they sing.



Birds have different kinds of bills.

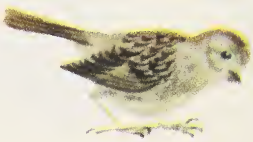
This bird has a sharp bill. It can find insects in trees.



Woodpecker

What can these birds do with their bills?

Sparrow



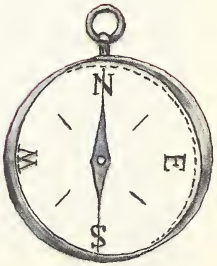
Hawk

Some birds fly away when it gets cold. They fly far away. Sometimes they fly many miles over water.

The birds come back when it gets warmer. We do not know how they find their way.

Are some birds flying away now where you live?

Are some birds coming back?



Birds make nests in the spring.
Birds make their nests in different places.
Birds make their nests of different things.

Swift

This bird makes a nest of sticks.

Meadowlark

This bird makes a nest of grass and weeds.

Oriole

This bird makes a nest of string and bits of cloth.

The mother bird lays eggs in the nest. She sits on them. She keeps the eggs warm.

The father bird brings food to the mother bird.

A baby bird grows inside the egg.
It grows bigger and bigger.
Then it comes out of the egg.

Baby birds eat and eat.

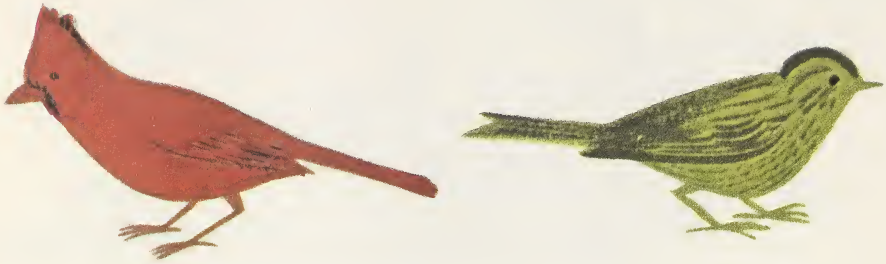
The baby birds grow very fast.

Their wings get strong. Then the birds fly away.

The mother bird and the father bird find food for them.

Here are some things baby birds eat.

Some birds are hard to see.
You can find out why.
Make some birds out of paper.



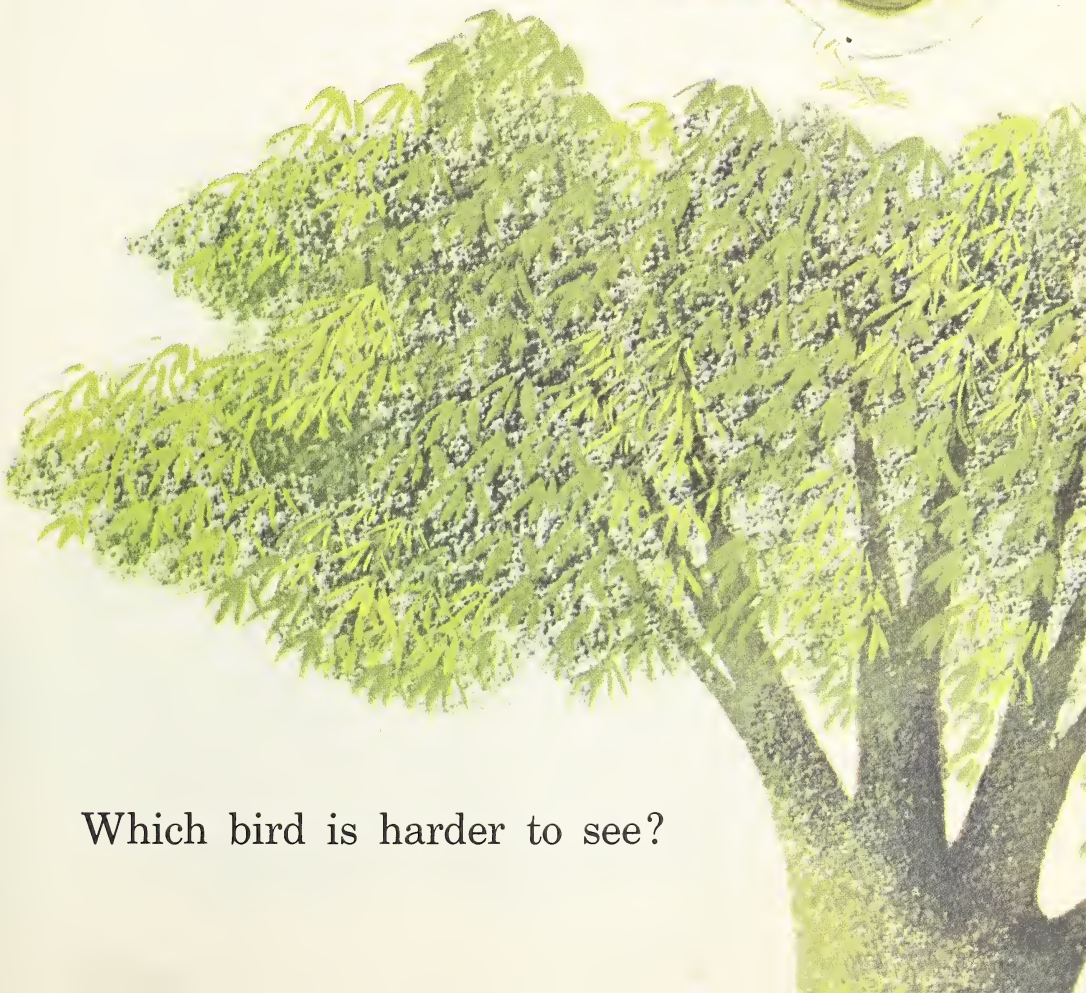
Color the birds this way.

Put the birds in this grass.
Which bird is harder to see?

Make some birds out of paper.

Color the birds this way.

Put the birds in this tree.



Which bird is harder to see?

The mother bird sits on the eggs.

The father bird does not sit on the eggs.

Which bird is harder to see?

A mother bird

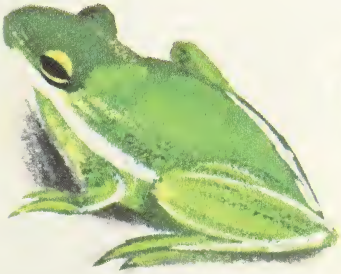
A father bird

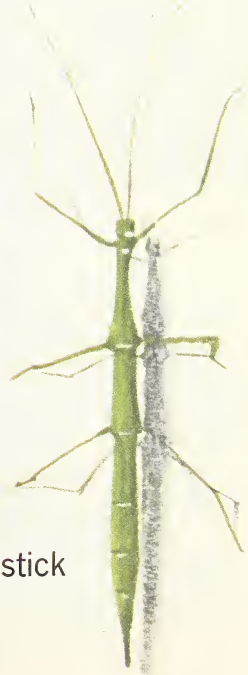
These animals are hard to see.
Can you tell why?

Polar bear

Sea horse

Tree frog





Walking stick

Animal Homes

Animals need a safe place to live.

Animals live where they can find food.

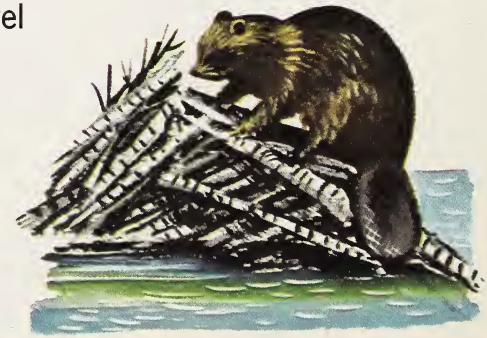
Here are some animals and their homes.

Woodchuck

Earthworm

Squirrel

Beaver



Ants

Ants are animals.

Ants do not live alone. They live with many other ants. Ants live in an ant hill.

This is a worker ant.

This is a queen ant.

The queen ant is bigger than other ants. She lays eggs.

You can find out more about ants.

Get some ants and do this.

Ants need food. What will you give them to eat? How will they get water?

Vocabulary and Sentence Structure

The Macmillan Science Series is designed to present meaningful content that is interesting and challenging to pupils. The authors have recognized the reading problem involved in presenting worth-while content, and have met this problem by (1) using a carrying vocabulary of words commonly found in readers, and (2) carefully presenting selected science words to help the pupil gradually acquire a science reading vocabulary.

In order to establish a workable carrying vocabulary for this book, the authors analyzed the vocabularies of the various basal readers most widely used in first grades. Lists were made of the words commonly found in pre-primers, primers, and first-grade readers.

To keep the increase in difficulty gradual, the authors used a pre-primer carrying vocabulary through the first two units (pages viii–43), a primer carrying vocabulary through the next three units (pages 44–97), and a beginning first-reader carrying vocabulary for the last unit.

A limited number of words, listed on the next page, falls outside the carrying vocabulary. Some of these words are proper names; some are words, like *what* and *how*, which may not have been mastered by the children at this level; some are technical words, such as *insect*, *germs*, *magnet*, which are necessary for the development of the science-health concepts. Many of these words are interesting to the children so that they are easily remembered.

Most of the words that fall outside the carrying vocabulary need not be taught for mastery. But these words should be practiced enough so that children will remember them. These words are essential for reading or writing activities based on science, health, and safety.

In addition to carefully controlling the vocabulary, the authors have controlled sentence structure. The sentences, at first short and very simple, gradually increase in length and variety.

One additional feature of the reading plan should be noted. The authors have included in the text certain parts which pupils should not be required to read, but which may offer a challenge to the better readers. Thus there are picture labels which are not necessary to an understanding of the pictures or of the text. But the pupil can easily "read" many of these words by naming the items in the accompanying pictures, and the better readers will acquire many of these words permanently. The end of the last unit is graded in difficulty for fast readers. Through these built-in devices, the text enables the teacher to provide for individual differences.

viii. changes
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72. Ted
Judy
73. David
Fred
74. Larry
Peggy
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77. bedtime
78. Ben
television
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80. Nancy
81.
82. Dick
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86. rainbow
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89. Tim
Jane
90. traffic
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99.
100. alike
insect
crayfish
101. snake
102. penguin
103. classroom
guinea pig
104.
105. cardinal
flicker
hummingbird
wild canary
swallow
106. hawk
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115. walking stick
polar bear
116. beaver
earthworm
woodchuck

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